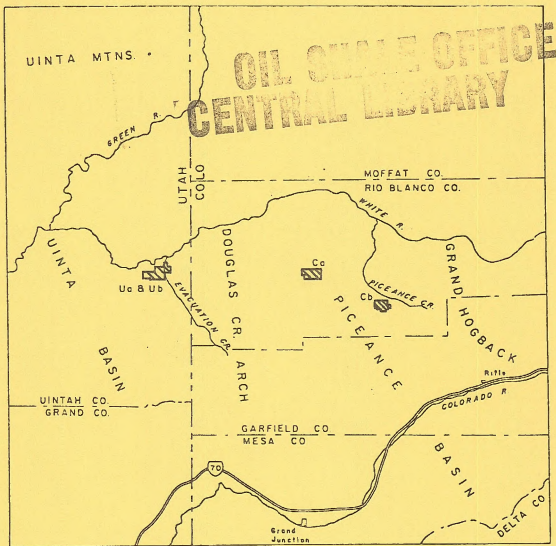


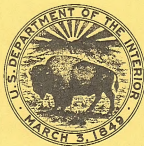


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PROTOTYPE OIL SHALE LEASING PROGRAM



DEPARTMENT OF THE INTERIOR  
U.S. GEOLOGICAL SURVEY  
AREA OIL SHALE OFFICE



JANUARY 15, 1979

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## FEDERAL PROTOTYPE OIL SHALE PROGRAM

1971 to DATE

U.S. DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
AREA OIL SHALE OFFICE  
GRAND JUNCTION, COLORADO

### Background

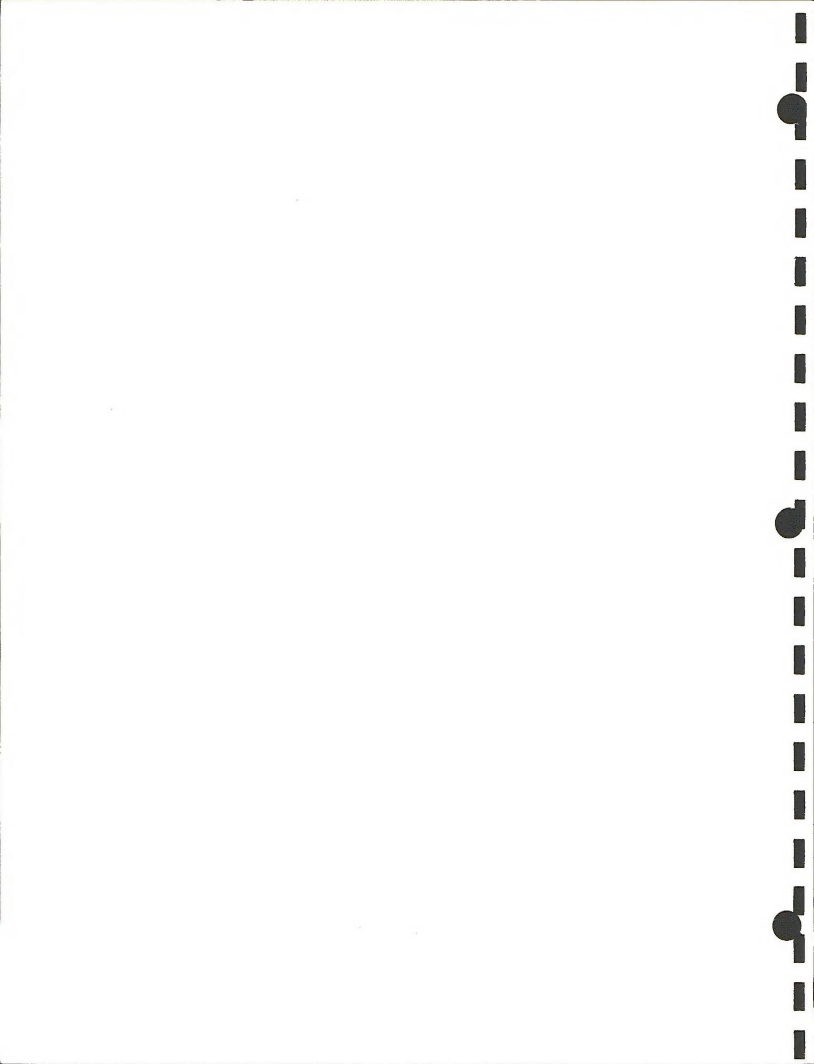
The history of oil shale from the "beginning" to recent times has been one of great promise and equally great frustration. Oil shale was known before the discovery of our Nation's petroleum deposits and its occurrence is widespread, both internationally and in this country. The deposits of current interest occur in the Green River formation of Colorado, Utah and Wyoming where the resource is estimated to exceed 1.8 trillion barrels.

The combination of events during the recent past which lead to the current energy situation, and the current level of oil shale technology have convinced many that now is the time to begin the testing of oil shale at a commercial level under a carefully conceived and controlled program.

Following an unsuccessful attempt to lease in 1968, the Interior Department officially began efforts through the Oil Shale Task Force to create the prototype program in 1971. Those efforts culminated in a six volume Environmental Impact Statement and the sale of four leases for 449 million dollars early in 1974.

The current oil shale program is a prototype in all aspects; in regard to the mineral and its production; in regard to the type and method of regulation of public resource development, and in regard to the organization established to supervise the program.

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The program goals stated by the Secretary of the Interior are:

1. To provide a new source of energy to the Nation by stimulating the development of commercial oil shale technology by private industry;
2. To insure the environmental integrity of the affected areas and at the same time develop a full range of environmental safeguards and restoration techniques that will be incorporated into the planning of a mature oil shale industry, should one develop;
3. To permit an equitable return to all parties in the development of this public resource; and
4. To develop management expertise in the leasing and supervision of oil shale development in order to provide the basis for future administrative procedures.

CONSERVATION DIVISION, U.S. GEOLOGICAL SURVEY

The Conservation Division has two primary functions, (1) the classification and evaluation of Federal lands as to their mineral character, and as to their apparent tract values prior to lease sale; and (2) the supervision of industry operations incident to the prospecting, development, and production of minerals on Federal, Indian, and Naval Petroleum Reserve lands. Both functions are concerned with the discovery, receipt of fair market value, efficient development and conservation of leasable minerals belonging to the United States, and the preservation of the environmental quality of those lands affected by mineral operations. The lease supervision functions include the responsibility for determining applicable royalty charges and for collecting royalty income on all Federal and Indian land leases.

Classification and evaluation is carried out by Division Geologists and Hydraulic Engineers. Supervision of industry operations is carried out by Division Petroleum and Mining Engineers. Royalty collections are made by Division professional accountants and accounting clerks.

Division Engineers, Geologists, and Mineral Economists make pre-lease sale economic evaluations of tracts prior to competitive lease sales of the Bureau of Land Management. Such values are considered in the evaluation of bids for acceptance or rejection.



Under the provisions of the National Environmental Policy Act, the Conservation Division cooperates with the surface administering agencies in environmental analyses and in the preparation of environmental impact statements (if required) prior to issuance of leases. After mineral leases are issued, the Conservation Division assumes the responsibility for environmental analyses and impact statements covering proposed mineral prospecting and development.

The goals of the Conservation Division are:

1. Orderly and timely mineral resource development on Federal and Indian lands with prevention of waste in the extraction of these resources.
2. Protection of environmental quality and the achievement of exemplary practices in operations on Federal and Indian lands.
3. Return of fair resource value to the public.
4. Impartial application of laws, regulations, and orders to lease operations.

In order to achieve the goals of the Program and carry out the responsibilities of the Division, the Area Oil Shale Office under the U.S. Geological Survey, Conservation Division, Central Region was created immediately following the disbanding of the Oil Shale Task Force.

#### AREA OIL SHALE OFFICE

This office has the prime responsibility of carrying out the goals set out by the Secretary for the Federal Prototype Leases. The organization scheme for the office recognized that maximum participation by other agencies and the public was one of the Secretary's desires for the program. Attaining this participation is a tremendous task in view of the diffusion of expertise needed for the program throughout many agencies. The Area Oil Shale Office is greatly assisted in this task by the Oil Shale Environmental Advisory Panel created to advise Department officials on environmental aspects of the prototype program.

A team approach with coordination on individual tract (Lease) basis using a management by objectives system, was selected as the most effective type organization for this program and is illustrated in

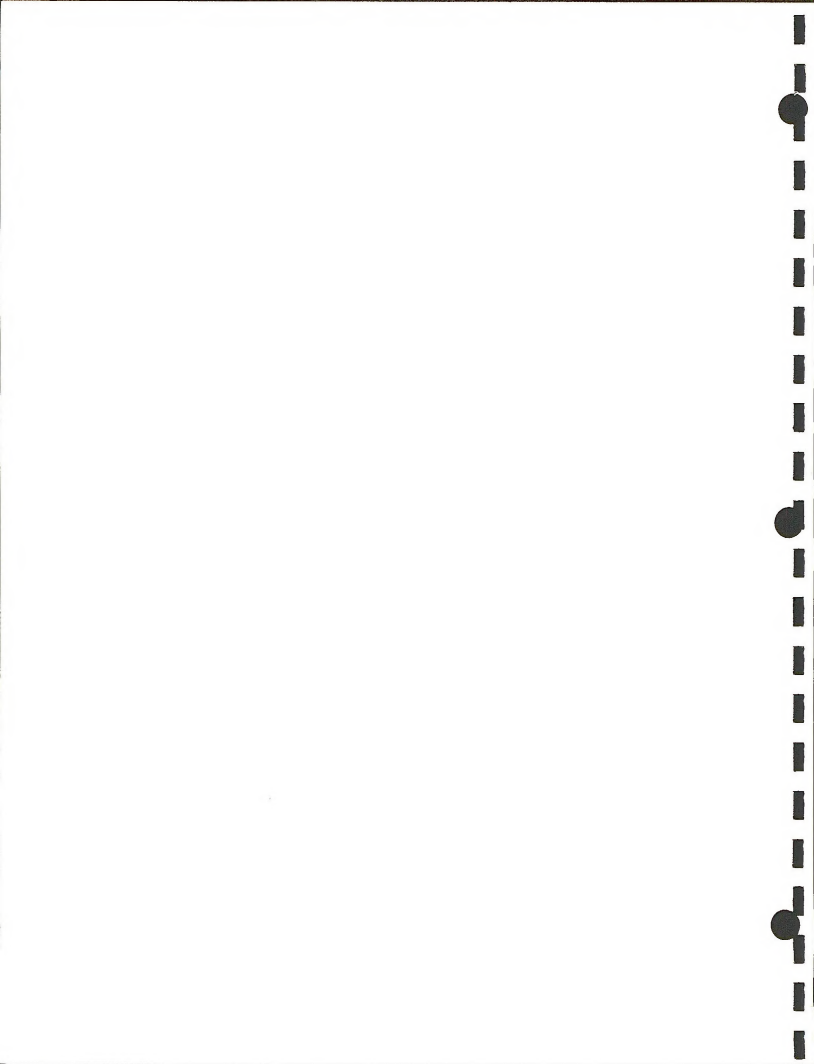


Figure 1. The personnel shown on the chart serve both in a regulatory capacity with regard to lease operations and most importantly in a coordination/liaison capacity to bring into the program the maximum amount of outside expertise. These people come from a variety of different agencies and include, in one case, a person employed by a sister Interior agency attached to the staff by agreement. To supplement the permanent staff, personnel details have been used from time to time. Also, contract assistance for specific projects continues to be used.

The management responsibilities of the Area Oil Shale Office in response to the program goals include:

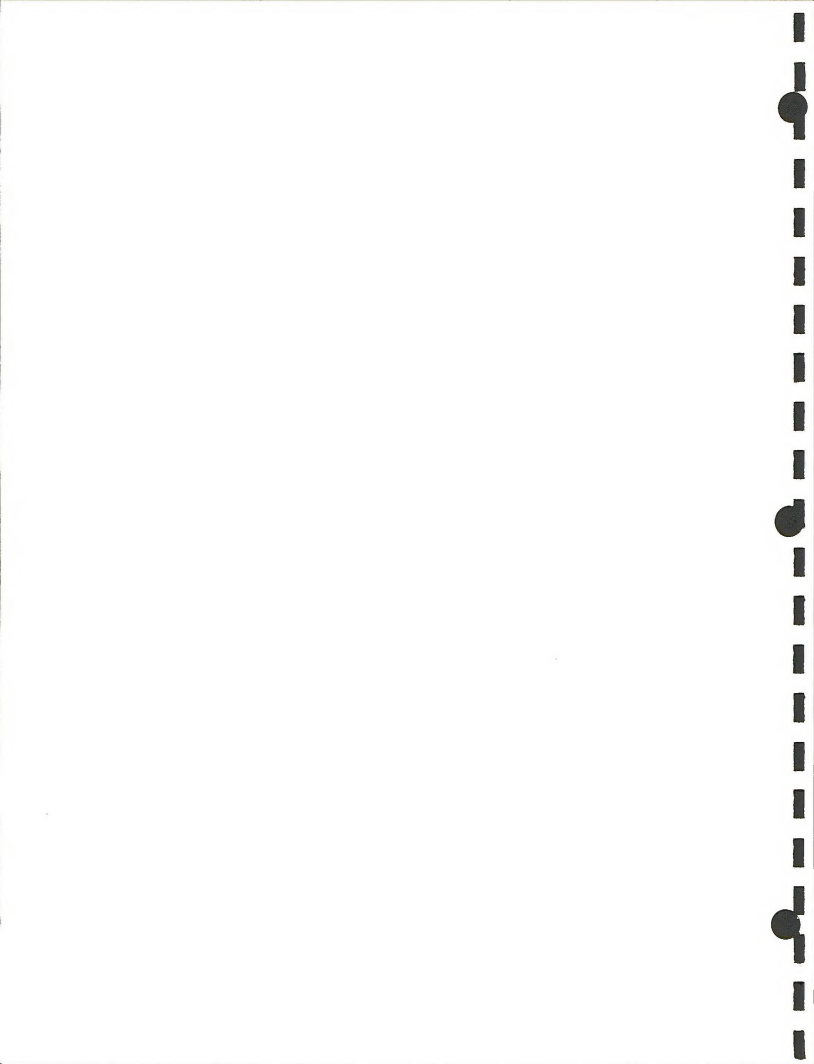
1. Supervision of lease activities in accord with existing knowledge which stems from the oil shale lease, and the applicable laws and Federal Regulations.
2. Reevaluation on a continuous basis of ongoing lease programs and implementation of changes, as the prototype program was based on the premise that much would be learned and that knowledge would be promptly applied. More than 60 separate approvals or revisions have been made during the exploration and baseline data phase of the program, including three revisions of lease environmental stipulations.
3. Provision of information for future decisions on oil shale, requiring this office to collect and analyze all data from the program and document the results, a task also necessary for refining operations on the current leases.
4. Continuing development of the management structure and expertise needed to effectively supervise what is learned, and implementation of that structure for the current program.

Specific duties of the Area Oil Shale Office with regard to each Lease include:

All actions and programs must be approved.

The results of all actions and programs must be submitted in the form of detailed data and summary reports.

Results from programs and actions must be analyzed in order to:



- Determine compliance with lease terms and other applicable laws and regulations.
- Revise ongoing programs to reflect information gathered.
- Revise Oil Shale Lease Environmental Stipulations in accordance with information gathered.

Results from programs and actions must be distributed to the public and agencies with interest or statutory authority in the oil shale program.

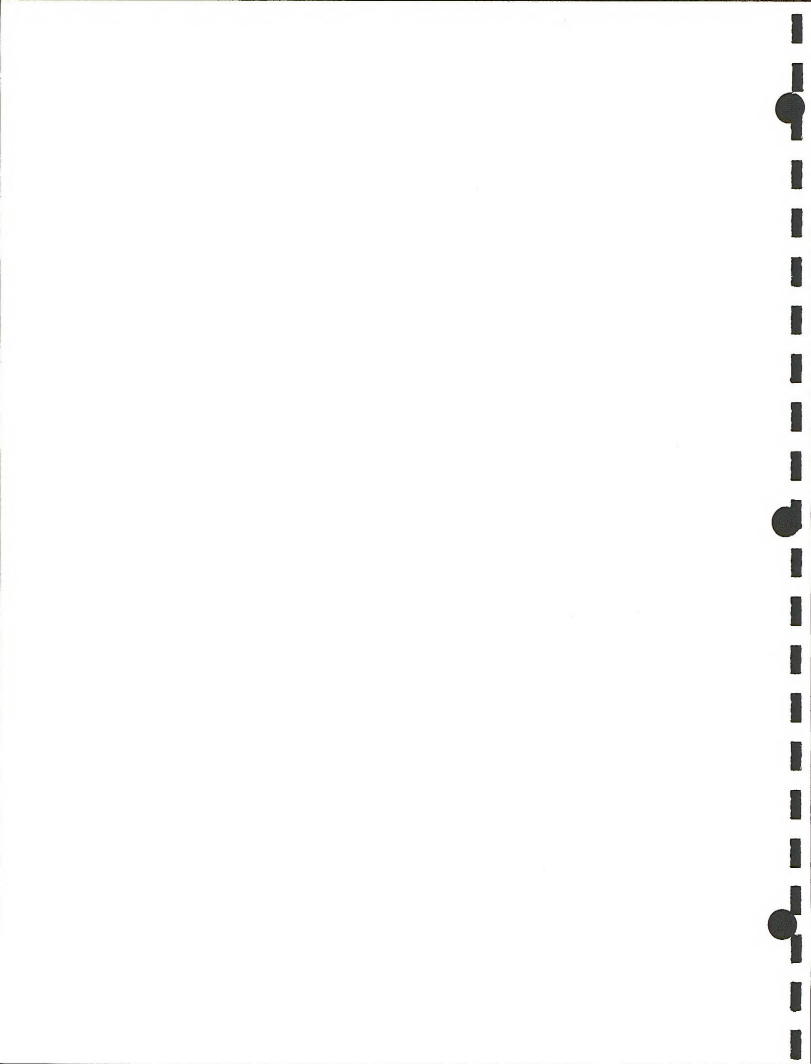
Maximum possible input from other interested agencies and the public must be incorporated into the program. Figure 2 illustrates some of the interfaces required during development and revision of these programs.

#### ENVIRONMENTAL BASELINE AND EXPLORATION PROGRAM

Each lessee completed what can only be described as one, if not the most comprehensive, environmental baseline data collection and exploration program associated with any mineral development. The environmental assessment activities included evaluation of surface and subsurface hydrology, air quality and meteorology, plants and animal life, soil productivity, and archaeology. The leases require that environmental baseline data be collected for a period of at least two consecutive years, one year of which must precede the submission of the Detailed Development Plan. This data will be used to determine the conditions existing prior to oil shale development on the leased lands. Each lessee spent between five and seven million dollars in the collection of this baseline data. During 1977 each lessee submitted a final environmental baseline report which presented an analysis and summary of the two year's data.

After the lessees have compiled comprehensive baseline data on all environmental parameters in their leased area, they are obligated to conduct monitoring programs before, during and subsequent to development operations and to continue these until the Area Oil Shale Supervisor is satisfied that all Federal, state and local environmental requirements have been met.





## DETAILED DEVELOPMENT PLAN

Before the lessee can commence development operations on the Federal oil shale leases, the Area Oil Shale Supervisor must approve a Detailed Development Plan submitted by each lessee. Each lessee has submitted a Detailed Development Plan and one lessee has submitted a Modification to their Detailed Development Plan.

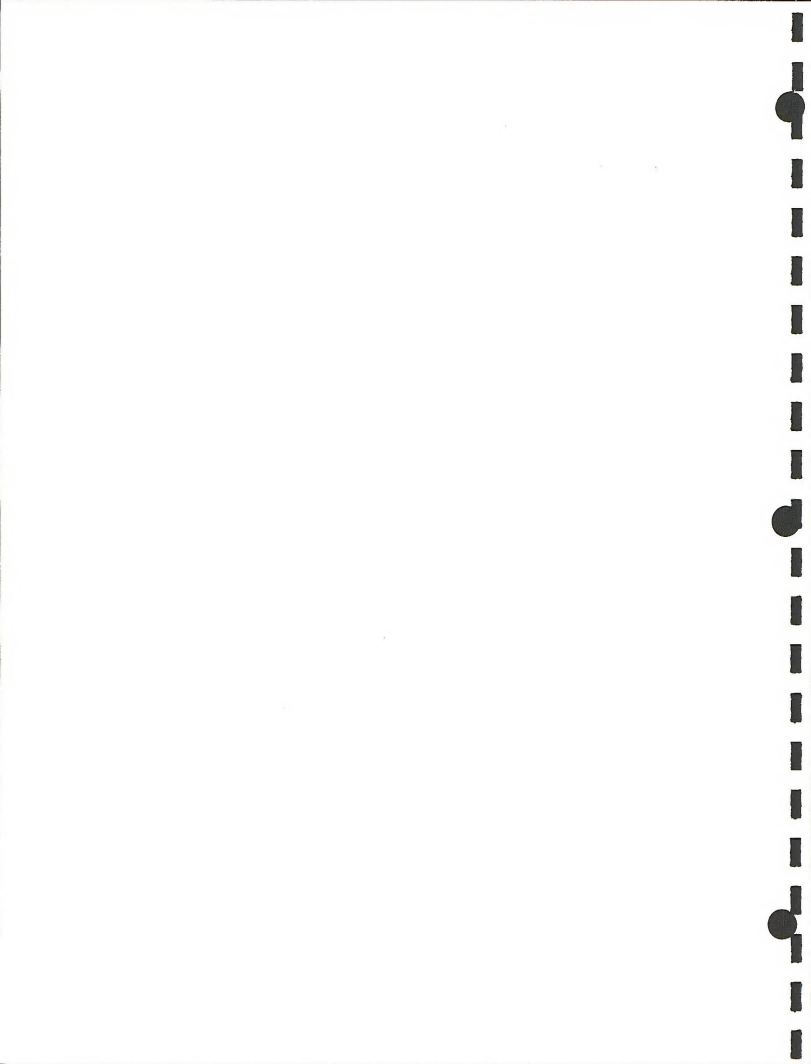
What is it? The lease says in a short paragraph that it is (1) a schedule of the planning, exploratory, development, production, processing and reclamation activities to be conducted under this lease, (2) a detailed description pursuant to the applicable Codes of Federal Regulations of the procedures to be followed to conform to the environmental criteria and controls in the lease, and (3) a requirement that the lessee will use all "due diligence" in the orderly development of the leased deposits to attain as early as is consistent with compliance with the provision of the lease, a production rate at least equal to the minimum royalty rate. No operations will be conducted on the lease except pursuant to an approved plan, and provision is made for revision of approved plans.

Debate on what the plan should be has varied immensely with most of the questioning directed toward the level of detail required. In order to resolve these questions, some form of guidance from this office was required, and that effort commenced with the MITRE Corporation's work on contract to the Area Oil Shale Office and ended with a final outline prepared and distributed by this office. Throughout the preparation of the outline, all parties were consulted and kept informed in order to obtain the maximum input, and in view of time constraints, so that the end product would contain no surprises, and other parties could continue their planning during the formulation of the outline.

The outline, in addition to providing guidance to others also, and most importantly, serves as a guide to the Area Oil Shale Office in reviewing submitted plans for adequacy. As each lease, and operations on each lease will differ, it is not intended that all plans conform exactly to the form of the outline. In fact, all are different and will serve to select the most desirable presentation for any future plans which may be required from other lessees.

The basic principles incorporated in the outline in addition to lease requirements were:

1. The plan should give an overall picture from commencement of operations to final reclamation.
2. The level of detail would vary with time--early actions can be detailed, long range actions would, of necessity, be conceptual.



3. A most probable path should be traced through available alternatives for the life of the lease.
4. Alternatives are to be discussed for major actions where there are alternatives.
5. Environmental impacts and mitigating measures are to be succinctly described.
6. Approved plans could be revised or modified to reflect knowledge gained under the terms of the lease.

There has never been any doubt that any Detailed Development Plan would be a complex, lengthy document.

#### How do we handle it?

In order to define critical problems and paths, a flow chart was developed with the assistance of the Regional Solicitor's Office, the Oil Shale Environmental Advisory Panel, and other knowledgeable people.

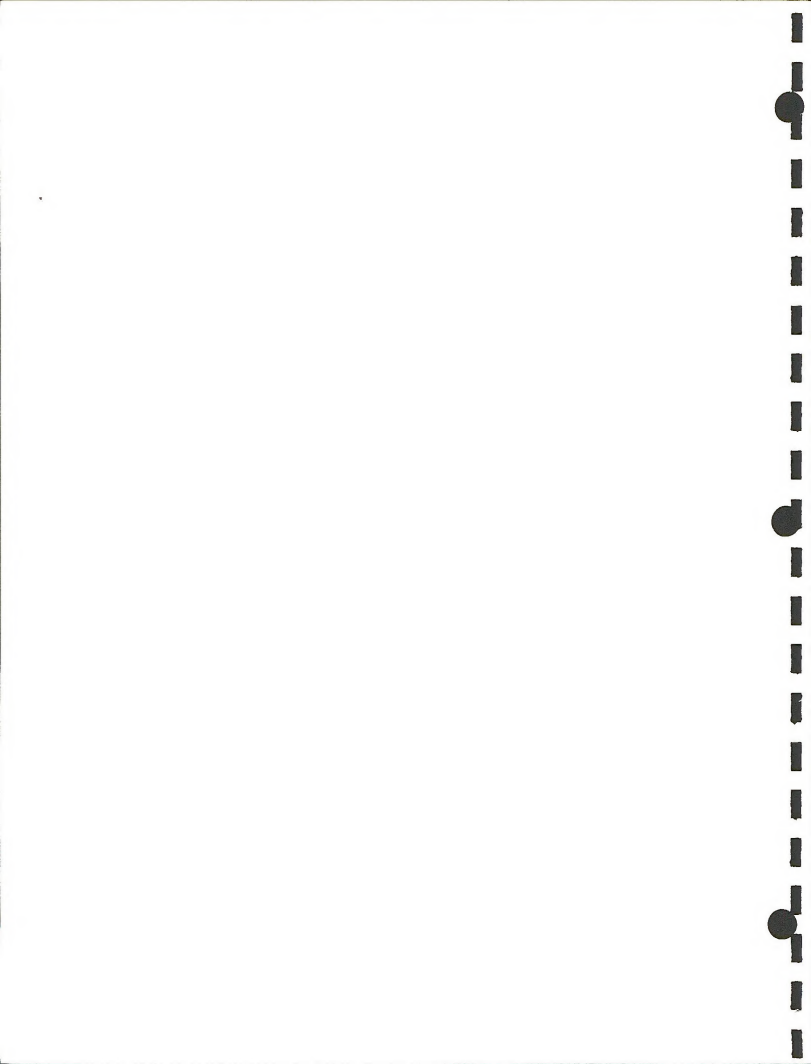
Figure 3 illustrates the parties involved (lessee, Area Oil Shale Office, Panel and Public) and the four phases of the effort (preliminary, review, decision, and resubmission) are also illustrated.

The important principle incorporated in this concept is that all review will be performed on the lessee submission in order to avoid the recycling and multiple document problem which would make meeting the time frames listed in the lease impossible.

Figure 4 illustrates the procedures for review of the DDP modifications, and Revisions for Tract C-a and C-b.

#### DATA DISTRIBUTION

To maximize the use of the vast amount of data being generated by the program, an extensive effort has been made to place relevant portions and summaries in the hands of agencies who have expertise in critical areas. All data from the program, including summary reports, is submitted to the Area Oil Shale Office and in turn is provided to interested agencies and persons. Open file copies are maintained for public inspection in the Area Oil Shale Office and summary reports are sent to libraries in the region.

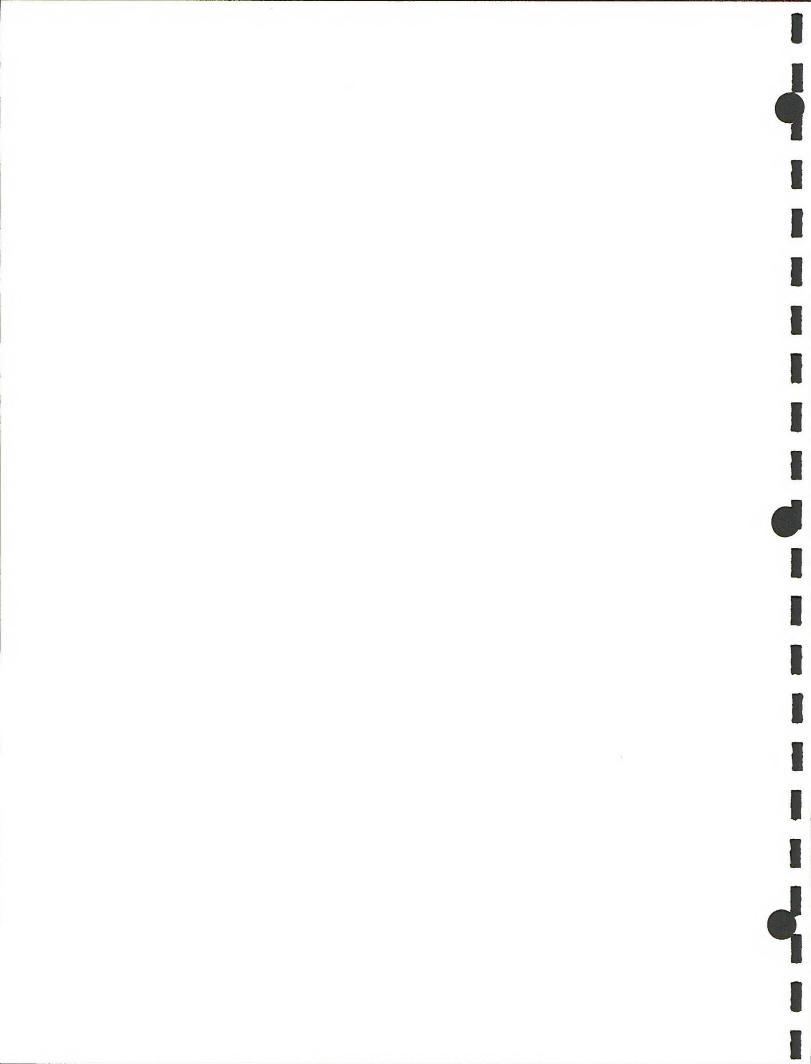


### BONUS OFFSETS

The lease contains a provision which permits the last two of five equal installments of lease bonus bids to be offset by expenditures related directly to development of the lease tract. In June of 1975 the Department issued a series of guidelines for the Area Oil Shale Supervisor's use when considering bonus offsets. It is anticipated that the last two bonus bid payments for all four leases will be totally offset.

### SUMMARY OF PROGRESS

- |                  |  |
|------------------|--|
| June 29, 1971    | The prototype program was announced by Secretary Morton. <ul style="list-style-type: none"><li>- A preliminary environmental statement, program statement and state reports on oil shale were released.</li><li>- Informational corehole drilling was authorized.</li></ul>  |
| November 2, 1971 | The Department requested oil shale lease tract nominations. <ul style="list-style-type: none"><li>- Twenty individual tracts were nominated.</li><li>- Six tracts were selected for leasing - two each in Colorado, Utah and Wyoming on April 25, 1972.</li></ul>  |
| August 29, 1973  | The final environmental statement on the prototype program was submitted to CEQ. <ul style="list-style-type: none"><li>- Regional impacts of a one million barrel per day industry.</li><li>- Specific impacts from development of the six selected lease tracts.</li><li>- Methods of shale oil production including conventional underground and open pit mining with surface retorting, and <u>in situ</u> processing of oil shale.</li></ul> |





January-June 1974      Prototype oil shale lease sales were held as follows:

<u>Lease</u>	<u>Sales Date</u>	<u>Effective Date</u>	<u>Bonus Bid</u>
C-a	1/8/74	3/1/74	\$210,305,600
C-b	2/12/74	4/1/74	117,788,000
U-a	3/12/74	6/1/74	75,596,800
U-b	4/9/74	6/1/74	45,107,200
W-a	5/14/74	*	
W-b	6/11/74	*	

\*The Wyoming leases received no bids primarily because of the restricted resource base.

- The bonus bids are payable in five installments, the first three have been paid, the last two may be offset by development expenditures as an incentive for prompt lease development.

February 27, 1974      Oil Shale Environmental Advisory Panel (OSEAP) was established and the first meeting held on April 15 of 1974. The purpose of the Panel is to:

- Continue and ensure maximum feasible public participation in the program.
- Advise Interior officials, particularly the Area Oil Shale Supervisor and BLM District Managers, on the environmental aspects of the program.

June 1974      The Area Oil Shale Office was established within the Central Region of the Conservation Division, U.S.G.S., to administer the program and was staffed as a multidisciplinary organization.

May-August 1974      Exploration and environmental baseline data plans were received for the four prototype tracts.

- These plans were revised and approved with conditions by October 1974.



- Environmental baseline data collection commenced in the fall of 1974 and required two years worth of data which was completed by the end of 1976.

December 23, 1975 TOSCO and ARCO withdrew as tract C-b lessees. Management felt that inflation, economics, and lack of government incentives made development of the lease unattractive. Shell and Ashland, the remaining lessees, continued work toward submittal of a Detailed Development Plan.

March-June 1976 Lessees submitted the required Detailed Development Plans as follows:

<u>Tract</u>	<u>Date</u>	<u>Development Methods</u>
C-a	March 1976	Open pit with indirect heated surface retorting.
C-b	Febr. 1976	Underground mining with indirect heated surface retorting.
Ua/Ub	June 1976	Underground mining with direct and indirect heated surface retorting.

- Over 200 copies of each of these plans and other reports under the program have been distributed to OSEAP, interested agencies, individuals, and libraries.

March-July 1976 Lessees apply for a suspension of operations pursuant to Section 39 of the Mineral Leasing Act and the Oil Shale Lease.

- Tract C-b lessees applied on March 4, 1976.
- Tract C-a lessees applied on July 2, 1976.
- Lessees of Tracts U-a and U-b applied for a suspension on July 19, 1976. On September 27, 1976, the lessees withdrew their original suspension application and submitted a new application.

August-October 1976 Suspensions of operations were granted for tracts C-a and C-b in August 1976 and for tracts U-a and U-b in October 1976 for the following reasons:



- All tracts: Data from the first year environmental baseline air quality program showed that natural background amounts of non-methane hydrocarbons, ozone and particulates on occasion exceeded National Ambient Air Quality Standards (NAAQS). EPA was consulted on this issue prior to granting the suspensions. During the period of suspension, EPA worked on this issue and further communication took place.
- Tract C-b: The on-tract drilling and rock mechanics program revealed that rock strength was considerably less than that assumed from mines on the basin margins, thereby decreasing the resource recovery by room and pillar methods to an unacceptable degree.
- Tract C-a: Open pit development of this tract was one of the methods for development envisioned in the environmental statement. The need for off-tract disposal sites was recognized in the statement and the Notice of Lease Sale. Subsequent to the sale, the Solicitor determined that the Department did not have authority to grant use of off-tract lands. Bills were introduced in Congress to authorize the use of off-tract lands.

November 2, 1976      Shell Oil withdrew as a Tract C-b lessee and the remaining lessee, Ashland Oil, announced a partnership with Occidental Oil Shale on November 4, 1976, for the purpose of using Oxy's modified in situ technology to develop Tract C-b.

December 21, 1976      The Environmental Defense Fund, Colorado Open Space Council, Friends of the Earth, and Denver Audubon Society filed suit against the Department of Interior questioning the authority to grant the suspension of operations.

- This suit was dismissed based on the omission of indispensable parties and improper jurisdiction.

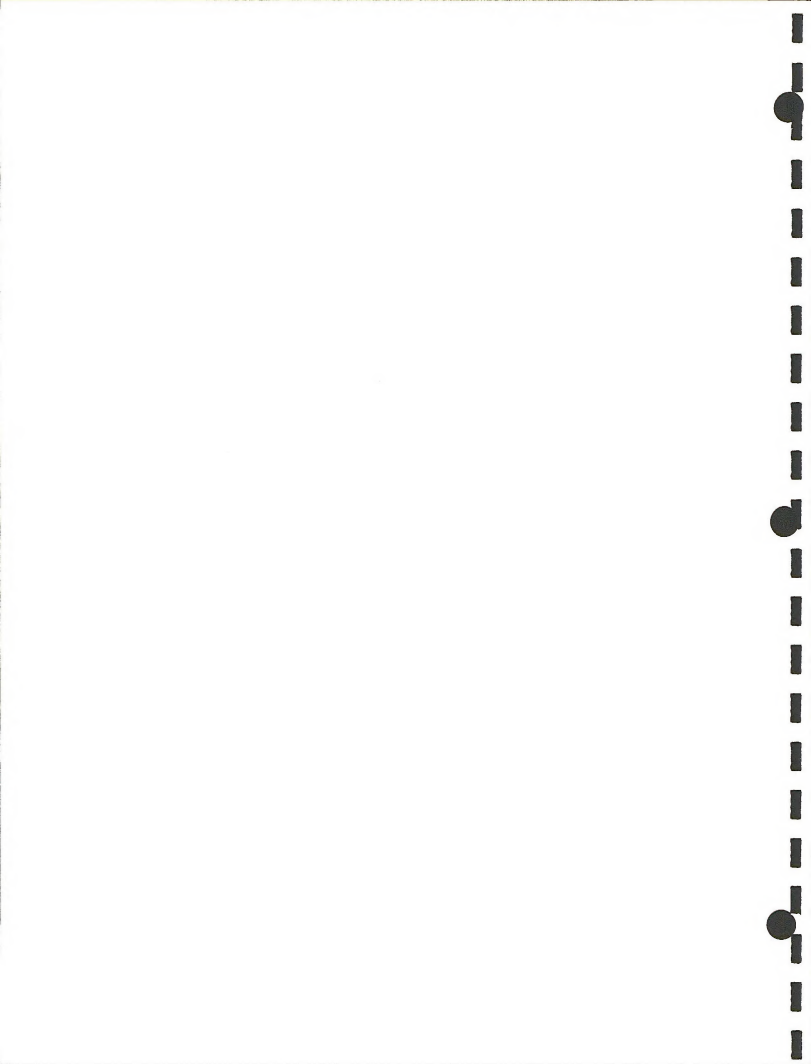


- March 1, 1977      The Tract C-b lessee submitted a modification to their development plan, revising the method of shale oil production from room and pillar mining with surface retorting to modified in situ methods.
- May 18, 1977      The lessees of Tract U-a and U-b filed suit against the Department of Interior seeking an injunction to indefinitely suspend the due diligence requirements, including bonus payments, of the lease until conflicts with regard to overlapping mining claims and state in lieu land selection of the leased areas were resolved.
- A hearing on a preliminary injunction was held on June 3, 1977, and continued to June 8, 1977, when the injunction was granted.
- May 25, 1977      The Tract C-a lessees submitted a revision of their development plan revising the method of shale oil production from open pit mining with surface retorting to modified in situ methods, with surface retorting of development rock.
- The C-a lessees also submitted an application to extend suspension of operations beyond the September 1, 1977, expiration date because the issue of baseline violation of National Ambient Air Quality Standards had not as yet been resolved.
- The transmittal letter offered to withdraw the application if the issue was resolved prior to September 1, 1977.
  - The original suspension notice required lessees to file for an extension, if they wanted one, 90 days prior to termination. The lessees of tract C-b did not file by the cutoff date.
- July 5, 1977      John A. Green, Regional Administrator for EPA Region VIII, sent the Area Oil Shale Supervisor a technical support document that provided the basis for an opinion by EPA that the presently measured air quality concentrations on the oil shale tracts do not preclude the development of the tracts' resources.
- This resolved the air quality issue which was no longer a valid issue for extending the suspension.





August 9, 1977	The Assistant Secretary - Energy and Minerals - was provided with the technical review documents and a draft approval letter for the C-b DDP prepared by the Area Oil Shale Office, and asked to concur in the Mining Supervisor's preliminary determination that the revised DDP be approved.
August 30, 1977	The Assistant Secretary - Energy and Minerals - concurred in the approval action and the approval letter for the modified DDP for modified in situ development of Tract C-b was formally signed by the Mining Supervisor and the lessees. The letter contained 12 specific conditions regarding environmental protection, monitoring, water management, abandonment, and <u>submission of engineering plans for lease compliance evaluation prior to implementation.</u>
September 1, 1977	The one year suspension of operations for both C-a and C-b were terminated and the request for an extension by C-a was denied.
September 22, 1977	The Assistant Secretary - Energy and Minerals - concurred in the approval action and the approval letter for the revised DDP for modified in situ development of Tract C-a was formally signed by the Mining Supervisor and the lessees. The letter contained 7 specific conditions regarding environmental monitoring, final design plans, shale disposal, emission modeling for commercial phase and <u>submission of engineering plans for lease compliance prior to implementation.</u>
December 6, 1977	The Environmental Defense Fund, the Colorado Open Space Council, and Friends of the Earth, Inc., filed suit in the United States District Court of Colorado seeking to enjoin any development of Tracts C-a and C-b through declaratory judgment that NEPA requirements had been violated and that approval of the DDPs and related right-of-ways should be overturned until a site specific EIS is prepared and fully processed through NEPA procedures.
January 1978	American Mine Service Company, contract for Rio Blanco Oil Shale Company, started shaft sinking operations on Tract C-a. The 15-foot diameter shaft will be sunk to a depth of 971 feet and is



expected to be completed by March 1979. This first shaft will be the Modular Development Phase service and production shaft. A ventilation shaft will be upreamed after completion of the service and production shaft.

February 1978

A contract was let to Gilbert Corporation, a subsidiary of Peter Kewitt and Sons, Inc., to sink four shafts on Tract C-b consisting of a 34-foot diameter service shaft, 29-foot diameter production shaft, a 15-foot diameter ventilation and escape shaft, and a 10-foot diameter temporary off-gas shaft. Shafts will be about 2,000 feet deep. The two larger shafts will be equipped with koepe hoists installed in 200 to 300-foot high concrete headframes and are believed to be the largest single service and production shafts in this country.

April 1978

Approval subject to audit was given to bonus off-sets for Tracts C-a and C-b totaling more than required fourth bonus payments.

August 8, 1978

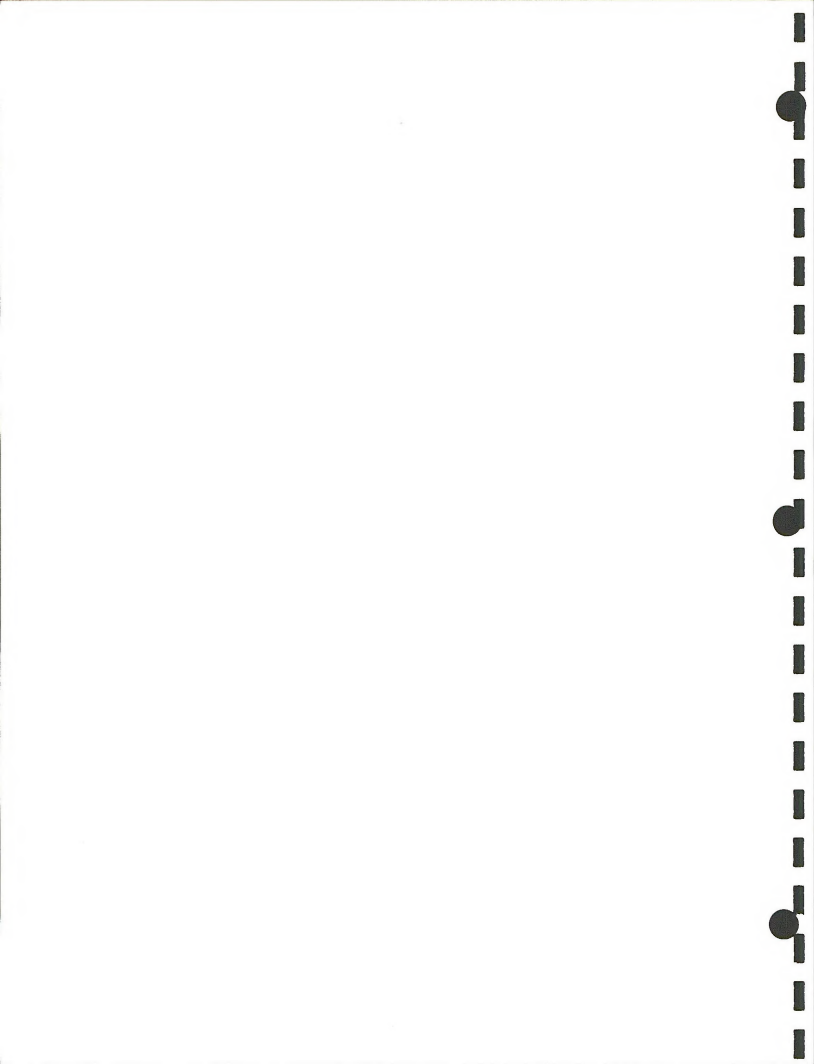
U.S. Court of Appeals ruled in favor of the State of Utah's claim to over 157,000 acres of in lieu land selections, including tracts U-a and U-b, in the Uinta Basin. On September 22, 1978, the Department of Interior filed a motion for rehearing before the Tenth Circuit Court. It is not known whether the issue will be heard by the U.S. Supreme Court.

August 25, 1978

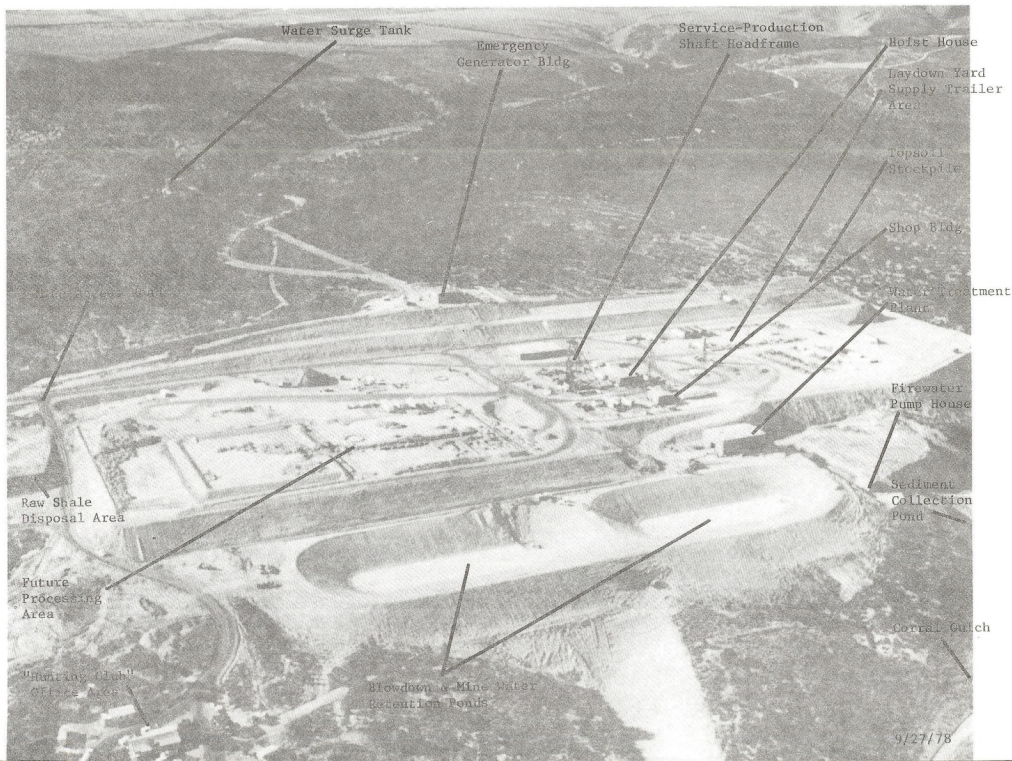
Judge Finesilver, of the U.S. District Court, issued a summary judgment dismissing the December 6, 1977, suit filed by the Environmental Defense Fund, Colorado Open Space Council, and Friends of the Earth. The court held that the 1973 EIS for the prototype program was sufficient for DDP and right-of-way approvals, and further held that the procedures of the AOSO were more than adequate to fulfill the requirements of NEPA. This summary judgment has been appealed by the Plaintiffs.



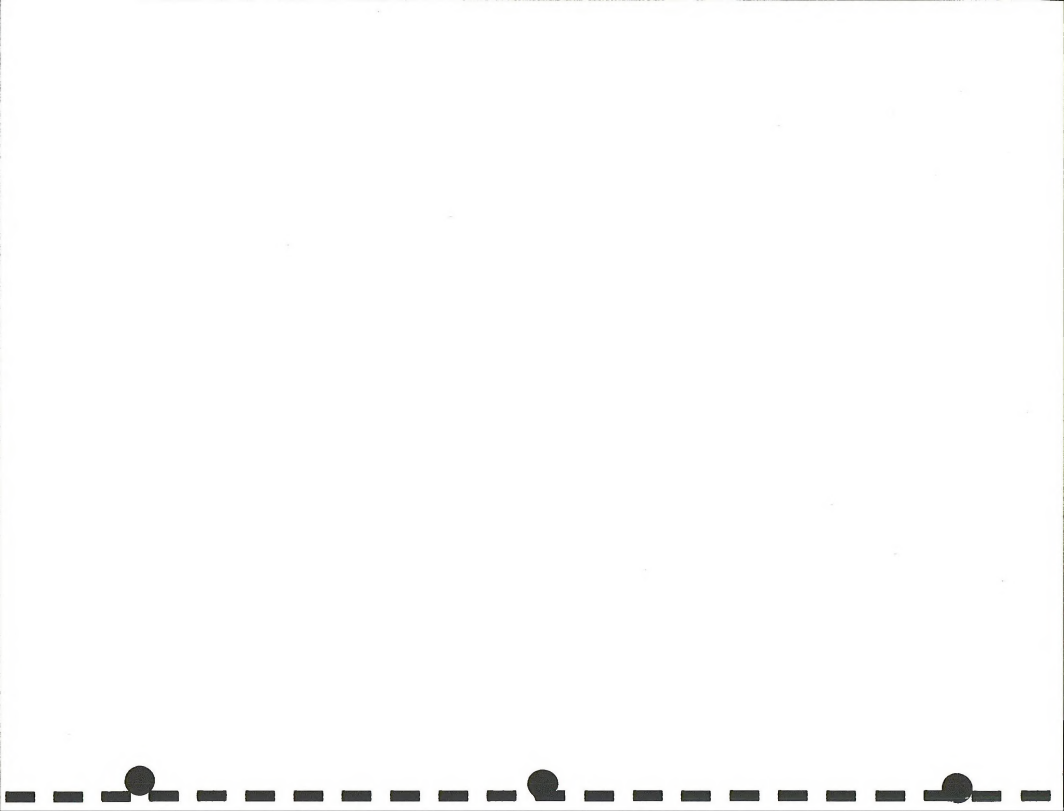
December 15, 1978 Ashland Colorado, Inc., announced that they will withdraw from tract C-b effective February 14, 1979. This leaves Occidental Oil Shale Inc. as the sole lessee. Ashland indicated that withdrawal from the C-b project was prompted by economic studies that suggest increased capital and operating costs may reduce profitability in the face of technical, political and regulatory uncertainties. This decision is in keeping with Ashland's corporate policy to emphasize projects that promise cash flow commensurate with capital requirements.

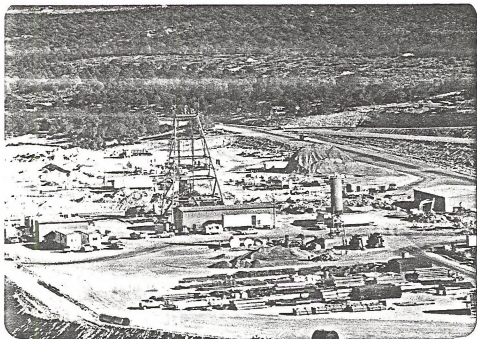






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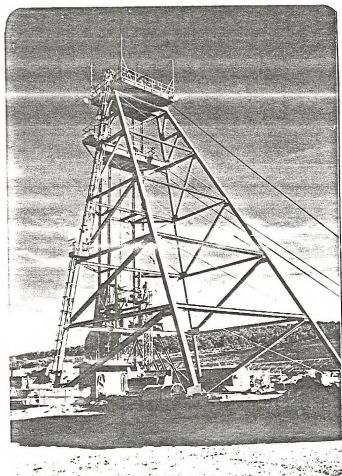


View to east across Mine Service Area of Tract C-a. Hoist House and headframe over 15-foot Service and Production Shaft in center. Lay-down yard, supply trailers, and concrete batch plant in foreground. Future construction of processing facilities in open area beyond shaft.

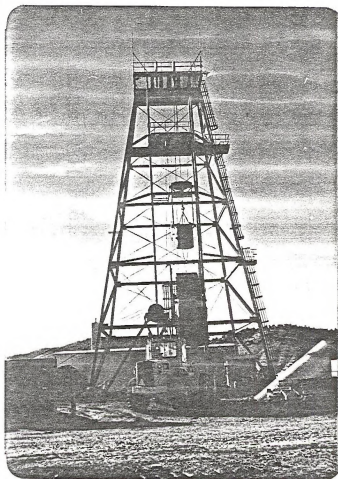


View to east across Mine Service Area and Blowdown retention ponds. Runoff water, shaft water, treated sewage effluent and processing blowdown waters are collected in ponds prior to being either reinjected or evaporated. Water treatment plant to right and fire water pump house in foreground.



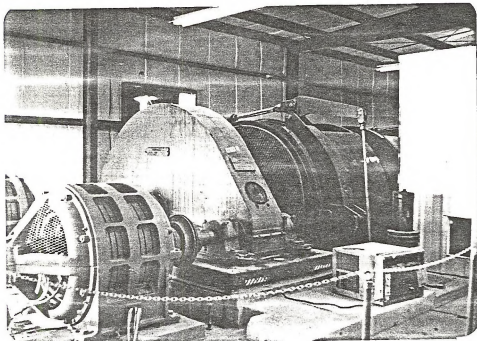


Two views of headframe over Service and Production Shaft in Mine Service Area. This shaft is a 15 - foot diameter concrete lined shaft with a final depth of 971 feet. Levels to develop the in situ retorts will be developed from this shaft.

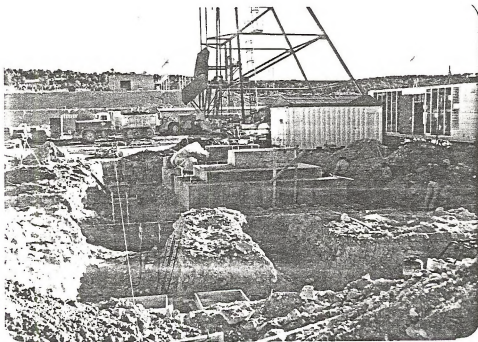








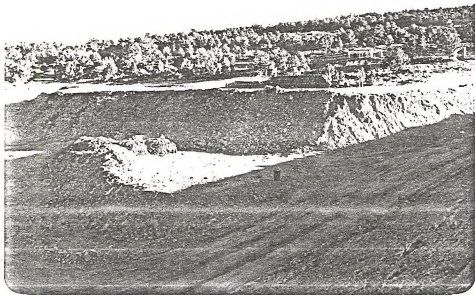
Main hoist located in Hoist House for raising and lowering sinking bucket during shaft sinking. These facilities will also be used as the permanent hoisting facilities after shaft sinking is finished.



Foundation work for Compressor Building in Mine Service Area north of Service and Production Shaft. Emergency generator building in background.





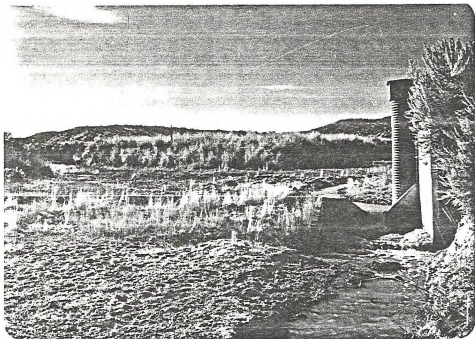


Initial raw shale disposal pile from shaft sinking operations. Shale from mine development during the Modular Development Phase (MDP) will be piled at this location just east of the Processing Area. The barrels on top of the pile contain raw shale samples to be sent to various research groups and laboratories for raw shale leachability, toxicity, etc., studies.

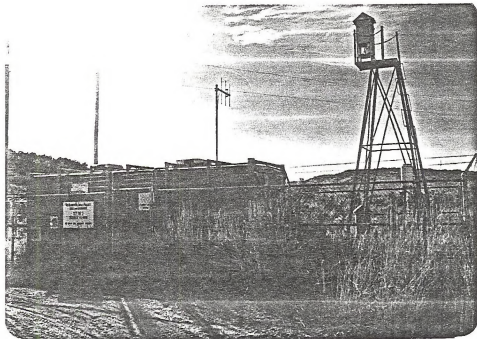


View of typical reinjection well installation. Foundation work almost complete for buildings to provide cold weather protection to well head equipment.



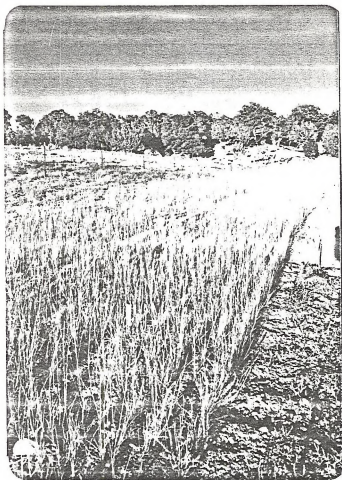


View of Corral Gulch water gauging station east of Tract C-a. Note "V" notch weir for measuring low flows. A concrete structure spans the entire drainage channel. Automatic equipment measures flow, temperature, conductivity, and suspended sediment load.



Meteorology - Air Quality collection trailer east of Tract C-a. Automated equipment measures temperature, wind speed and direction, humidity, sulfur dioxide concentration, nitrogen oxides, carbon monoxide, hydrogen sulfide and ozone. The instrument on the tower measures particulate concentration in the air.





View of revegetation study area. Tract C-a is presently monitoring revegetation success, plant vigor, and plant community composition on three revegetation sites. Two companion plots are on opposite north and south facing slopes. A third site was established with a layer of processed shale under a soil cover to determine the effect of potential leachate on revegetation success.



### Tract C-b

The Tract C-b lessee, Occidental Oil Shale, Inc. is actively developing the lease in support of future modified in situ operations on the tract.

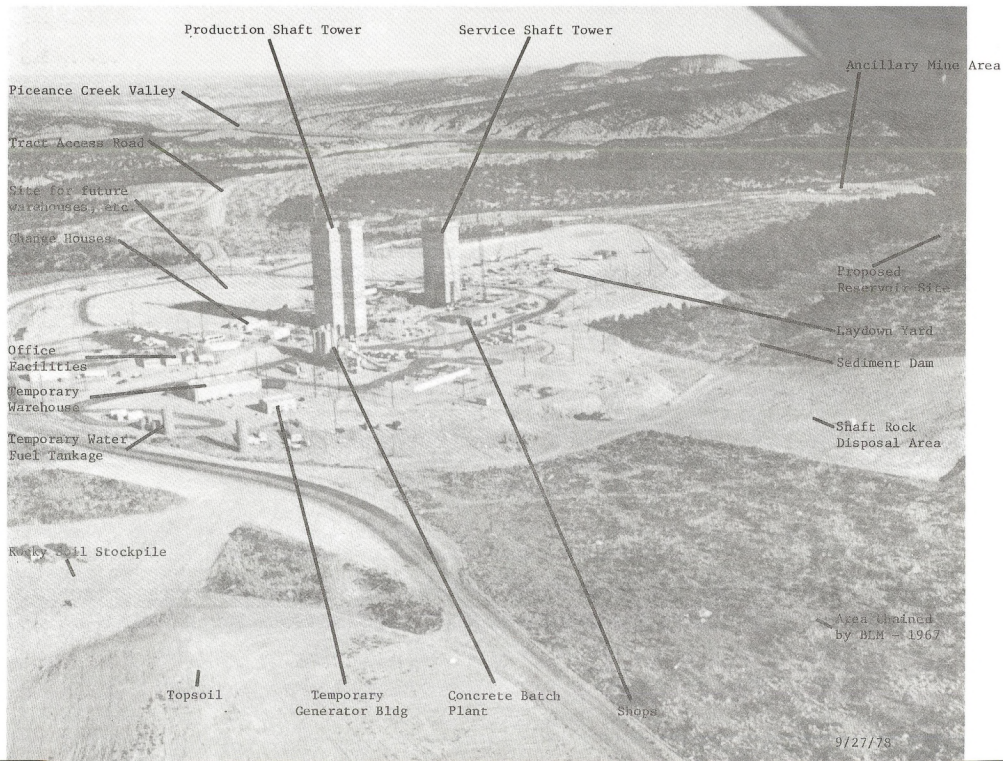
An approximately 30-acre mine support area in the northwest portion of the tract has been brought to final grade and is now the site of intensive development of commercial sized shafts and related mine surface facilities. Slipformed concrete hoist towers have been completed for the 34-foot diameter service shaft (177 feet high) and for the 29-foot diameter production shaft (313 feet high). Sinking operations on both shafts progressed to about the 70-foot level where sinking was temporarily halted while internal hoist towers and ground-mounted sinking hoists were being installed. Sinking operations are scheduled to restart in early January 1979. The 34-foot diameter air inlet tunnel to the service shaft has been completed. The production shaft will ultimately be equipped to hoist 66,000 tons per day. Within the mine support area, temporary administration buildings, a warehouse, generator sets, fuel and water tankage, powerlines, shops, compressor building, and a permanent concrete batch plant have been installed.

North of the mine support area, a 10-acre ancillary mine area has been brought to grade. Here work is well underway on a 15-foot diameter ventilation escape shaft and related hoist house, shops, and headframe. A 10-foot diameter retort off-gas shaft will also be sunk in this area. Together, these shafts will access the initial modified in situ retorts.

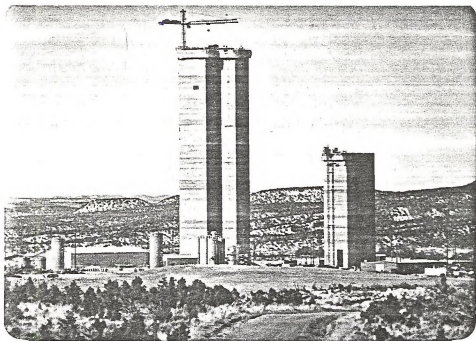
Both on-tract areas are accessible by a recently constructed all-weather, two-lane paved highway. Daily, nearly 300 workers are bussed to the site from nearby communities. Housing impacts have been mitigated by the lessee in these communities by the construction of front-end financed dwellings. This labor force will increase to about 400 persons during sinking of the three large diameter shafts.



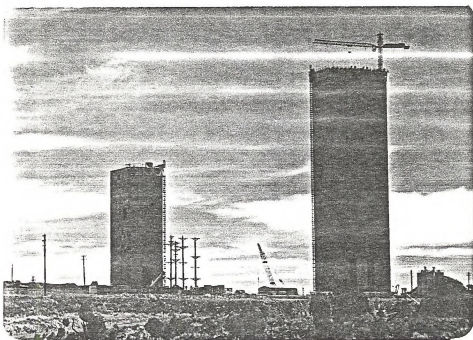






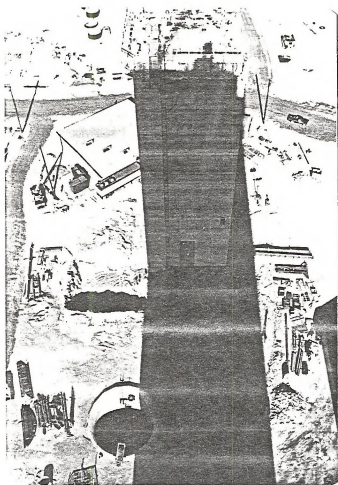


View toward northwest across Mine Support Area of Tract C-b. Mine facilities (left to right) consist of temporary water and fuel tanks; temporary warehouse and generator building; 313-foot high commercial hoist tower (84' x 46') over 29-foot diameter Production Shaft; silos for concrete batch plant; 177-foot high commercial hoist tower (55' x 45') over 34-foot diameter Service Shaft; and compressor and shop building for use during shaft sinking.

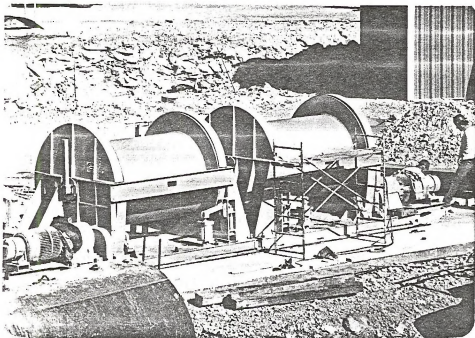


View toward the east across Mine Support Area. Pictured (left to right) are the commercial Service and Production Shaft concrete slipformed Hoist Towers. Openings are for equipment access, windows, and machinery ventilation. Towers will be used with temporary ground-mounted hoists to sink shafts. Contemporaneous with sinking, towers will be equipped with permanent internal mounted hoisting equipment, ore bins, ventilation stacks, and ore load-out facilities.





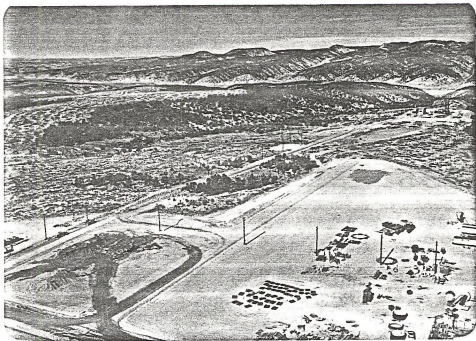
View seen from atop 313-foot high Production Shaft Hoist Tower toward Service Shaft Tower. In foreground is 34-foot diameter Air Inlet Tunnel that connects with the Service Shaft at a depth of 150 feet. Building housing temporary sinking hoists for the Service Shaft is visible to back left of tower.



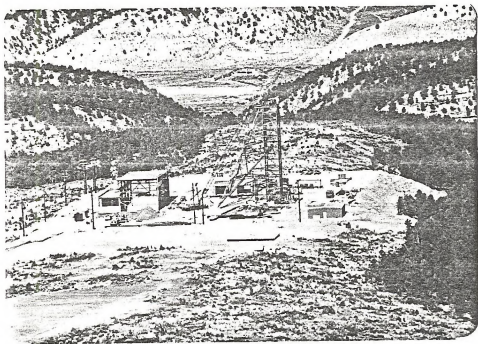
Hoists and cable drums for use in raising and lowering galloway stage during sinking of 29-foot diameter Production Shaft. Much larger hoists will be used to raise and lower equipment and hoist shaft rock during sinking.



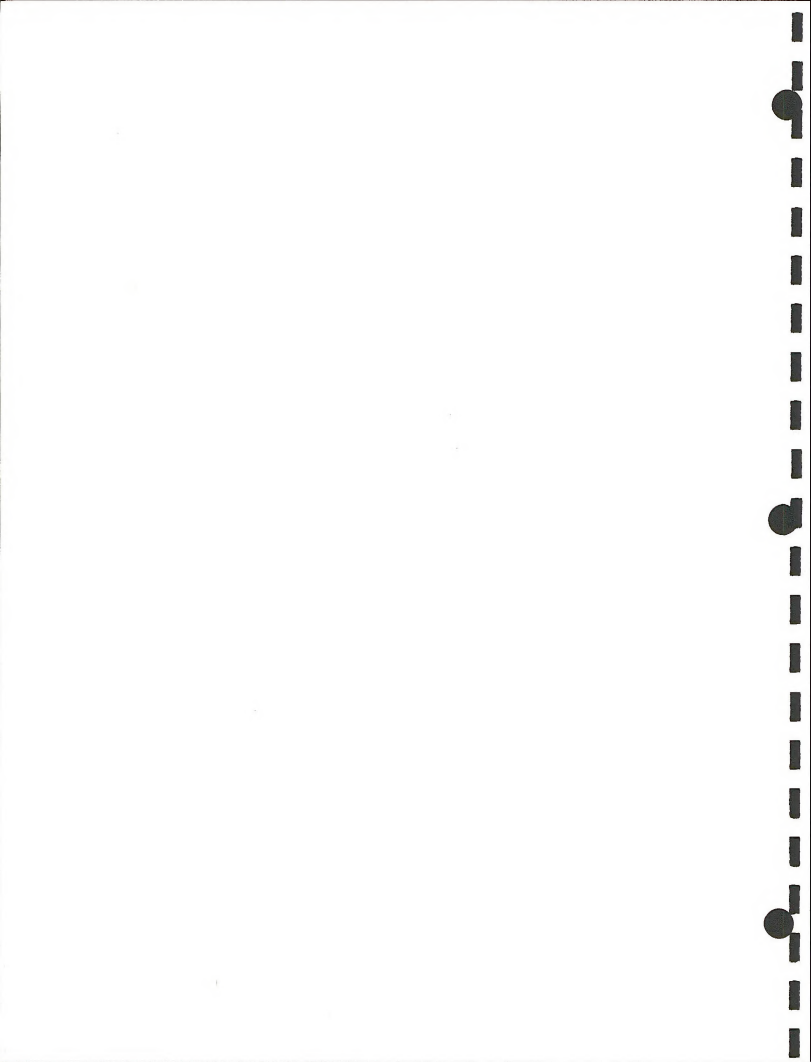




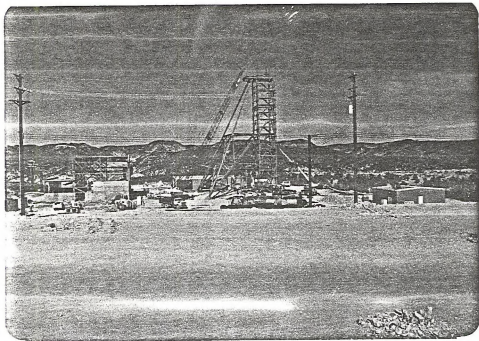
View toward north-northwest from atop Production Hoist Tower. Foreground is part of the laydown yard associated with the Mine Support Area. Ancillary Mine Area can be seen in upper right of photo. Ridge areas were chained by the BLM in the late 1960's (prior to leasing of the tract) to enhance range forage production.



Looking north across Ancillary Mine Area. Pictured (left to right) are: hoist house; shop and compressor building; 15-foot diameter Ventilation/Escape Shaft headframe; laydown yard; and change house. The V/E shaft together with a 10-foot diameter retort off-gas shaft will be used to operate initial commercial size modified in situ retorts beneath Tract C-b. This facility will then be used for auxiliary ventilation and emergency escape. Piceance Creek Valley is visible in background.



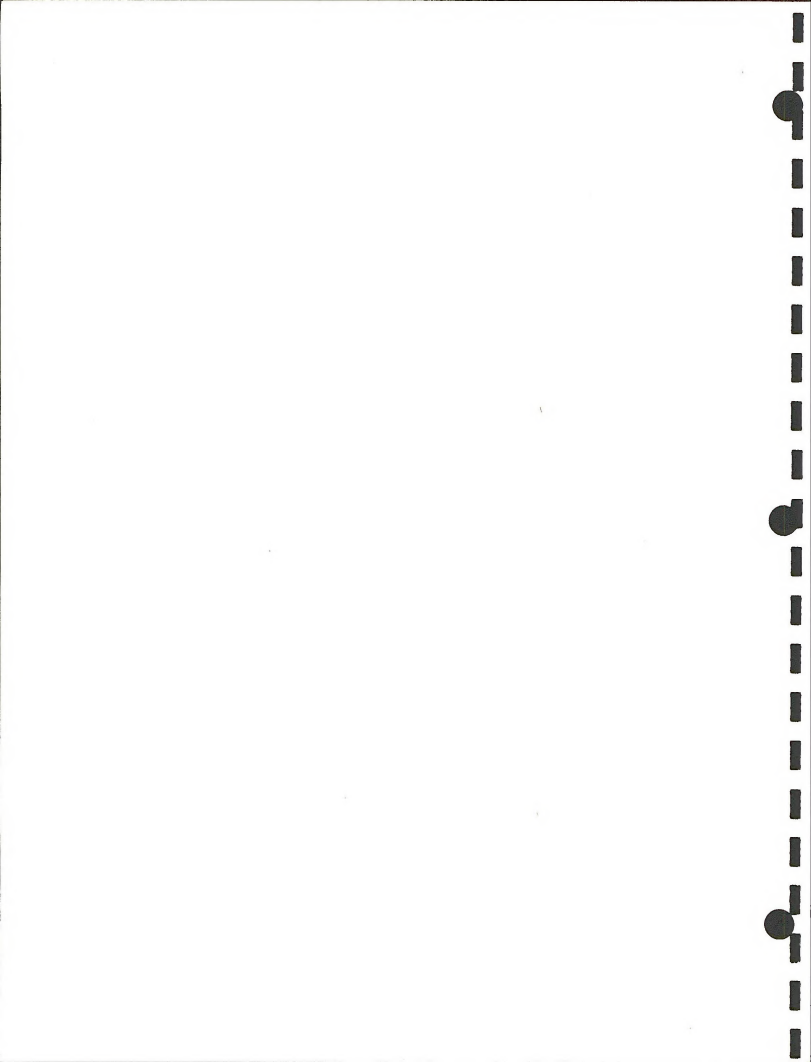


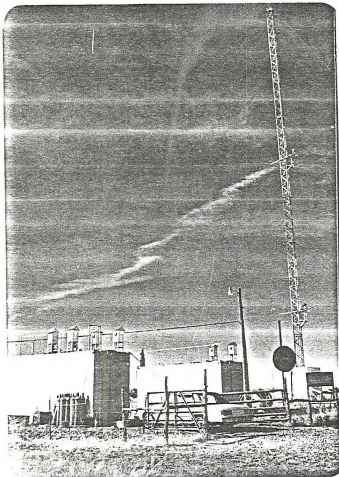


A closer view of the Ancillary Mine Area and shaft surface facilities is shown here. The facilities are nearing completion prior to commencement of sinking operations. Cleared area in foreground will be used for temporary retort off-gas processing, production storage, steam generation, and mine water treatment facilities.



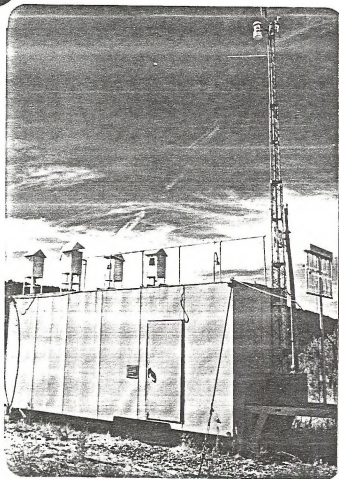
Buried telephone cable being installed along road between Mine Support Area and Ancillary Mine Area. Power will be provided initially by on-tract generator sets and later augmented by a line running south to the tract from Meeker, Colorado.





Shown here is the 200-foot (60 meter) main meteorology tower on Tract C-b. Tower is instrumented at three levels to gather air quality/meteorology data in conjunction with sampling and recording equipment housed in trailers in foreground. This facility will be used to monitor development related impacts on air quality and to provide a basis for continued air dispersion modeling.

Pictured here is a small air quality/meteorology sampling trailer along Piceance Creek north of Tract C-b. By comparing data between the valley site and the above on-tract station, local flow patterns within the tract airshed have been plotted, inversion layers noted, and dispersion patterns for emission from on-tract facilities modeled.





Tracts U-a and U-b

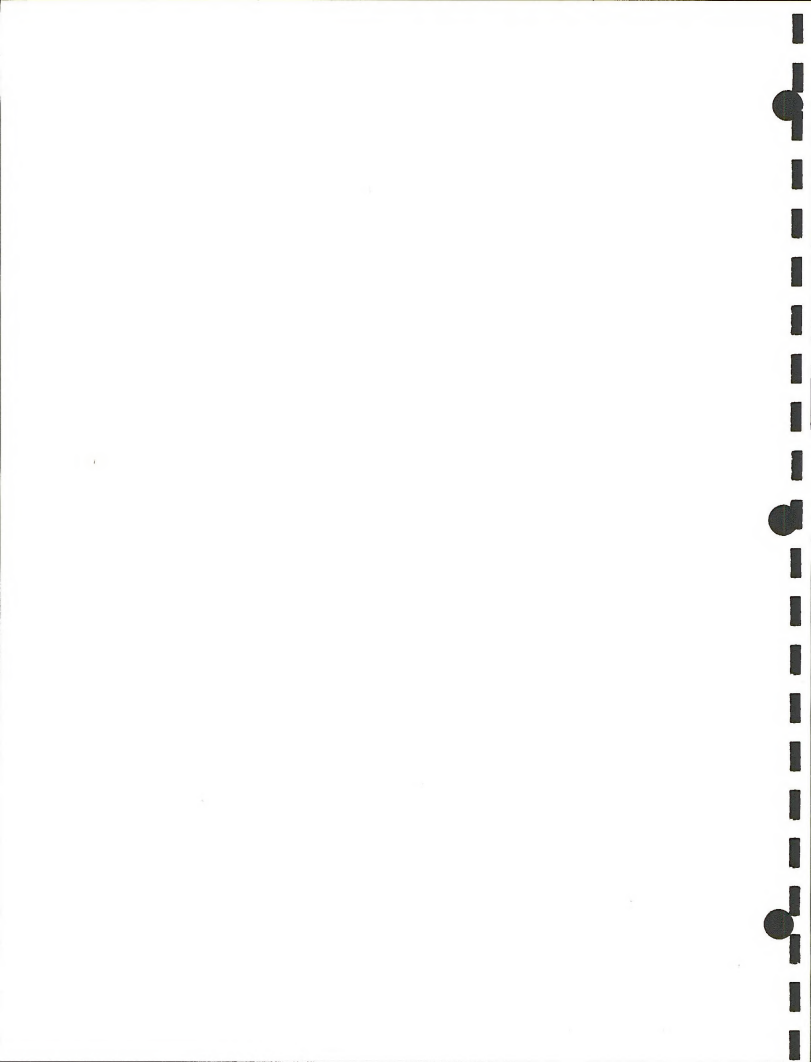
The White River Shale Project (WRSP) was formed in 1974 to operate the joint venture development of Tracts U-a and U-b in Utah. WRSP is responsible to Sunoco Energy Development Company, Sohio Petroleum Company and Phillips Petroleum Company (lessees) for carrying out the planning and implementation of development activities. The Utah lessees submitted the required Detailed Development Plan (DDP) to the Area Oil Shale Supervisor in June 1976 outlining a proposed underground room-and-pillar oil shale mine with 100,000 barrel per day oil shale surface retorting facilities. This DDP was never acted upon because of a suspension of operations effective November 1, 1976, and a preliminary injunction effective May 31, 1977.

The Lessees completed two years of environmental baseline monitoring in January of 1977 and have since been involved in interim (suspension and injunction) environmental monitoring. This interim environmental monitoring has been conducted for compliance with the lease and to fulfill condition 4 of the Suspension of Operations.

On August 8, 1978, the United States Court of Appeals, Tenth Circuit (Denver) ruled in favor of the State of Utah's claim to over 157,000 acres of in lieu land selections, including tracts U-a and U-b, in the Uinta Basin. This opinion affirmed the earlier U.S. District Court (Salt Lake City) decision of June 8, 1976. On September 22, 1978, the DOI filed a Motion of Rehearing before the Tenth Circuit Court of Appeals. If the Tenth Circuit Court decides not to rehear the case, DOI would have 90 days to file a Writ of Certiorari to the Supreme Court. If the Supreme Court decides not to hear the case, a final decision in this matter could be made by the middle of 1979. However, if the Supreme Court decides to hear the case, a final decision would not be reached until October 1980. This means one to two years before the legal entanglement is cleared and the ultimate fate of the Utah leases is known.

Prior to the request for rehearing, the AOSS prepared recommendations and specific information to aid in the decision on whether to go to the Supreme Court. The AOSS gave two alternatives to the appeal of the U.S. Court of Appeals decision: (1) develop a cooperative agreement between the Department of Interior and State of Utah with respect to supervision of Tracts U-a and U-b and (2) selection of alternate Federal leases outside of the area of the State in lieu land selection. Both the cooperative agreement and alternative Federal leases would permit accomplishment of the prototype program goals as outlined earlier.

WRSP is not only keeping continuity of the environmental baseline studies but is researching technologies and performing Union retort studies in California. The parent companies have signed up for continuing support of the Paraho work at Anvil Points.



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Grand Junction, Colorado

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Don Dietz

POSITIONS:  
USGS 21  
USFWS 1

\*The Administrative Officer and Clerk work under the Regional Administrative  
Office for the Western Rocky Mountain Area.

FIGURE 1





Figure 4 (continued)

SCHEDULE FOR MAJOR  
DDP MODIFICATIONS  
TRACT C-b

ITEM 10

3/29/77

and

5/9/77 Decision to require further information from lessee prior to approval.

6/3/77 Presentation of air quality model to AOSO by lessee.

6/17/77 Presentation to AOSO of further information required of the lessee on 3/29/77 and 5/9/77 by the lessee.

6/21/77 Briefing for Mining Enforcement and Safety Administration, Bureau of Mines, Colorado Division of Mines by the lessee and AOSO.

6/22/77 Briefing for Bureau of Land Management by AOSO and lessee.

6/24/77 Transmittal to State of Colorado of responses to their comments and additional material to be added to the plan.

7/8/77 Meeting with the State of Colorado to resolve any remaining points of concern.

7/15/77 Completion of conditions of approval and approval of plan if issues are resolved satisfactorily.

